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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,763	10/23/2003	Scott J. Clifford	16129	6713

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EXAMINER	
KOCH, GEORGE R	

ART UNIT	PAPER NUMBER
1734	

DATE MAILED: 08/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/691,763	CLIFFORD ET AL.	
	Examiner	Art Unit	
	George R. Koch III	1734	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *31-60* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *31-60* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

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DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 7/7/2005 has been entered.

Claim Rejections - 35 USC § 103

2. Claims 31-33, 37-39, 40, 42, 44, 46, 48, 49, 51, 55, and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo (US Patent 4,721,630) in view of Yamamoto (US Patent 5,240,745) and Pearce (US Patent 4,781,517).

As to claim 31, Takeo discloses a modular apparatus for performing a process on an object conveyed to and from a location, comprising a pair of frame rails (items 11, see Figure 1) extending on opposite sides of a location and generally parallel to a path of conveyance of an object through the location, at least one robot arm (items 5_1 and 5_2) mounted on an associated on of each of the frame rail, and a tool mounted on each of said at least one robot arms for performing a process on the object whereby the at least one robot arms move the tools relative to the object enabling the tools to perform processes on the objects.

Takeo does not discloses that there are at least two legs attached to each of the frame rails for elevating the frame rails above a plane of an upper surface of the object at the location, and at least one cross support member connecting the frame rails together to from a rigid structure with legs.

Yamamoto (especially with reference to Figure 15) discloses that it is known to elevate painting robots by placing them on cross support members (item 572) on elevated frame rails (item 518) mounted on legs (items 94a(b), 94c(d), and 38 - best seen in Figure 16). The cross support member connects the frame rails, forming a rigid structure with legs. One in the art would appreciate that elevated positioning would enable better coating of the roof of the car body, while still maintaining the capability of coating the sides of the car body. However, Yamamoto does not place the robots on the frame rails. Pearce, though, discloses a modular apparatus for performing a process on an object conveyed to and from a location comprising a pair of frame members (*see Figure 2, which discloses a fixed frame and a single robot attached to the two fixed frames*) extending on opposite sides of a location and general parallel to a path of conveyance of an object through the location, at least two legs (items 13, 18, 19 and 20 in Figure 2) attached to each of the frame rails for elevating the frame rails above a plane of an upper surface of the object at the location, at least one cross support member (item 23 in Figures 2) connecting the frame members together to form a rigid frame structure with the legs, at least one robot arm (items 71 and 114) mounted on an associated one of the frame members, and a tool mounted on the at least one robot arms for performing a process on the object whereby the at least one robot arms

move the tools relative to the object enabling the tools to perform processes on the object. Pearce discloses, as shown in figure 2, that both frame rails are fixed as claimed. Placing the robots on the frame rails in opposed configuration as in Pearce would enable symmetrical process of a car body and better processing or coating reach of the car roof as in Yamamoto. The cross support both Pearce and Yamamoto would reduce the possibly of collapse by improving structural support. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized movable robots mounted on fixed elevated frame rails mounted on fix legs in order to provide better coating reach of the car roof and to have utilized a cross support in order to provide structural support.

As to claim 32, Takeo discloses that the robot arms extend to reach the tooled mounted thereon to all exteriors surface on one side of the object.

As to claim 33, Takeo discloses that the robots are positioned in opposition to provide symmetric processing to the object.

As to claim 37 and 38, Takeo discloses that each robot arm is a 6-axis robot with a wrist implement, with the non-wrist component of the arm having 3 axes, including axes for defining a generally vertical planar operating space, and the wrist component being connected to the free end of the arm and the tool, the wrist component having 3 axes (column 6, lines 48-64).

As to claim 39, Takeo discloses 6 axes of motion, including the four claimed.

As to claim 40, Takeo, as modified by Yamamoto and Pearce and applied to claim 1 above discusses the pair of frame rails mounted on opposite sides and extending generally parallel to the path of movement of the object (Takeo and Pearce), the frame rails being elevated above a plane of an upper surface of the object (see Pearce and Yamamoto), the frame rails being connected together in a rigid frame structure (Pearce and Yamamoto), at least one robot arm mounted on an associated one of each of said frame rails (Takeo), and that the robot arm is movable along the associated frame rail (Takeo and Pearce), and that both frame rails cannot move *relative* to each other, and both frame rails do not move *relative* to said frame (Pearce).

Takeo further discloses that each robot arm has at least two axes of motion for movement in a generally vertical plane transverse to the path of movement of the object (see column 6, lines 48-64). Takeo also further discloses that the tool is a paint applicator (bell type atomizers 5_f) mounted on each of the at least one robot arms (items 5_1 and 5_2) and the arms move the paint applicators relative to the object while the paint applicators dispense paint to cover the upper surface and side surfaces of the object with paint.

As to claim 42, both Pearce and Takeo disclose opposed symmetric robot designs. Takeo as incorporated discloses the capability of symmetric painting.

As to claim 44, Pearce as incorporated discloses that the frame rails are mounted on floor engaging legs (see Figure 2).

As to claim 46, Pearce discloses that the frame rails are connected by at least one cross support member elevated above the plane of the upper surface of the object.

As to claim 48, Takeo, Yamamoto and Pearce as applied to claim 1 above disclose or make obvious a modular apparatus for painting an object conveyed along a path, comprising a pair of frame rails (disclosed by Takeo, Yamamoto and Pearce) mounted on opposite sides of a path of conveyance of an object, the frame rails being elevated above a plane of an upper surface of the objects (Yamamoto and Pearce, as incorporated and applied in claim 1 above), at least one robot mounted on an associated one of the frame rails (Takeo and Pearce) and being movable along the associated frame rail (see Takeo, Yamamoto and Pearce as applied in claim 1 above), and that both frame rails cannot move *relative* to each other, and both frame rails do not move *relative* to said frame, therefore being secured against movement relative to the other of the frame rails.

Furthermore, Takeo discloses that each robot arm is a 6 axis robot with a wrist implement, with the non-wrist component of the arm having 3 axes and the wrist component of the arm having 3 axes (column 6, lines 48-64), and that there is a paint applicator (bell atomizers) mounted on each of said at least one robot for painting surfaces of the object.

As to claim 49, Takeo as incorporated discloses that at least one robot has an articulated arm with a paint applicator attached to a free end thereof capable of reaching substantially all external surfaces on a facing side of the object.

As to claim 51, Pearce as incorporated (and applied in claim 1 above) makes obvious that the frame members are mounted on legs engaging a floor of a painting

booth and are connected by at least one cross support member elevated above the plane of the upper surface of the objected to form a rigid frame structure (see figure 2).

As to claim 55, Takeo, Yamamoto and Pearce as applied to claim 1 above disclose or make obvious an apparatus for processing an object moving along a path, comprising at least one frame rail (Takeo, Yamamoto, and pearce) mounted to extend along a side of a path of movement of object, the at least one frame rail being elevated above a plane of the upper surface of the object (see Yamamoto and Pearce as applied to claim 1 above), at least one robot arm, and a tool mounted at a free end of the at least one robot arm for performing a process on the object, and that both frame rails cannot move *relative* to each other, and both frame rails do not move *relative* to said frame, although the two frame rails do move together.. However, the frame rails are considered capable of being kept stationary if desired, and therefore, are capable of meeting the intended use of being prevented from moving relative to the object.

Takeo also further discloses a mounting base (i.e., movable tables 12_1 and 12_2) attached to an movable along the frame rails which are capable of movement on the frame rails (item 11, recited as railway means, see column 6, line 44 to column 7, line 2), and that the robot arm has four axes of movement relative to the mounting base (Takeo discloses 2 more movement axes, for a total of 6).

As to claim 56, Takeo discloses a robot wherein said four axes of movement include two primary axes of operation defining a planar operating space for the tool transverse to the path of movement of the object.

3. Claims 34, 52 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce as applied to claims 31, 51 and 55 above, and further in view of Thome (US Patent 5,744,190).

The references as applied to claim 1, 21 and 25 above are silent as to the robot arms including a process controller mounted for movement therewith along the associated frame rail.

However, as to claims 34, 52, and 60, Thome discloses that it is known to include process controller (control systems 109a) within the robot bodies. Thome utilizes the process controllers in conjunction with sensors for robot feedback, and one in the art would appreciate that the close proximity of the control device to the sensors reduces the amount of wiring needed between the process control and the sensor. Therefore, it would have been obvious to one of ordinary skill in the art to have utilized such process controls in order to reduce wiring between the robot feedback mechanism and the process control. Furthermore, such a placement would result in the system being mounted for movement along the associated frame rail in the context of the robots used in Takeo (as modified by Yamamoto and Pearce).

4. Claims 35 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce and Thome as applied to claims 4 and 22 above, and further in view of Cebola (US Patent 5,738,727).

As to claim 35 and 53, Takeo, Yamamoto, Pearce, and Thomes as applied to claim 4do not disclose that the cross support member is hollow for receiving cables and conduits connecting the process controllers together.

Cebola discloses that it is known to make structural elements hollow or tubular for receiving cables and conduits connecting the process controllers together. Cebola discloses that shielding these cables protects from electrostatic fields and charges (see column 7, lines 37-45). Therefore, it would have been obvious to one of ordinary skill in the art to make cross beams and support elements tubular or hollow for receiving cables and conduits in order to protect the cables and conduits from electrostatic effects and charges.

5. Claims 36 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce and Thome as applied to claims 34 and 52 above, and further in view of Neikter (US Patent 5,296,026).

Takeo, Yamamoto, Pearce, and Thome as applied to claims 34 and 52 above do not suggest that at least one cross support member is tubular and purged with an inert gas or air for explosion protection as in claims 36 and 54.

Neikter discloses that it is known for the cross support (item 20) to have a gas permeable tubular element (item 22) surrounding the cross support for generating a positive pressure (see column 4, lines 12-29). Neikter also discloses that the gas presented to the room can be an inert gas such as argon (see column 5, lines 10-17). One in the art would appreciate that this would protect the robots from explosion and

prevent chemical interactions with the paint material. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized cross supports which spread inert gas in order to protect the robots from explosion and prevent chemical interactions with the paint material.

6. Claims 43 and 50 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to claims 40 and 48 above, and further in view of Josefsson (US Patent 5,766,355).

Takeo, Yamamoto, and Pearce as applied to claims 40 and 48 above do not suggest that the frame rails are mounted on walls of a paint booth extending generally parallel to the path of movement. However, Takeo, Yamamoto, and Pearce have been applied to show the frame rails

Josefsson discloses that it is known to have painting robots mounted inside of a paint booth. Josefsson discloses that the use of such a paint booth confines the paint to the chamber, and facilitates collection of the paint overspray (see column 2, lines 40-61). Josefsson discloses that collection of the overspray in a paint booth allows for the later reapplication of the excess paint to subsequent automobiles (see column 3, lines 29- 43), which one in the art would immediately recognize as reducing material costs. Therefore, it would have been obvious to one of oordinary skill in the art at the time of the invention to have utilized a paint booth with walls (as in Josefsson) in conjunction with the frame rail robot design (of Takeo, Yamamoto and Pearce) in order to confine the paint overspray and facilitate paint re-use, thus reducing paint material costs.

7. Claims 45, 47, 58 and 59 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto and Pearce as applied to claims 40, 46, and 55 (in the case of both claims 58 and 59) above, and further in view of Cebola (US Patent 5,738,727).

As to claim 45, 47 and 58, Takeo, Yamamoto, and Pearce as applied to claim 40 or 46 above do not disclose that either the frame rails are tubular, or the frame rail and cross support member are tubular.

Cebola discloses that it is known to make structural elements hollow or tubular for receiving cables and conduits connecting the process controllers together. Cebola discloses that shielding these cables protects from electrostatic fields and charges (see column 7, lines 37-45). Therefore, it would have been obvious to one of ordinary skill in the art to make cross beams and support elements tubular or hollow for receiving cables and conduits in order to protect the cables and conduits from electrostatic effects and charges.

As to claim 59, Cebola as incorporated in claim 28 above discloses coupling conduits stored with the structural elements (see Figure 4, items 224 and other items).

8. Claims 41 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeo, Yamamoto, Pearce as applied to claims 10 and 25 above, and further in view of Hohn et al (US Patent 4,896,274).

Takeo as applied to claim 10 or 25 does disclose a 6-axis robot with three of the axes being in a wrist mounting. Takeo, however, is silent as to the capabilities or movements of the 3-axis wrist mounting, and one would expect any conventional 3-axis wrist mounting to be used.

Hohn discloses a known 3-axis wrist mounting (item 27), for use in either adhesive application or paint spraying (column 3, line 36) in automobile industries, which is part of a larger, 6-axis robot, similar to that in Takeo. Take discloses two tilting axes (at pivot points 28 and 30), and a rotating axis (at point 32, as see column 3, line 65 to column 4, line 16 for discussion of the movements). Hohn recites that these three axes are intended to effect control over the orientation of the tool carried by the manipulator (or robot) with respect to a relocatable point of reference. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have utilized a wrist having a rotating axis and a tilting axis as in Hohn in order to effect control over the orientation of the tool carried by the manipulator (or robot) with respect to a relocatable point of reference.

Response to Arguments

9. Applicant's arguments filed 10/15/2004 have been fully considered but they are not persuasive. Applicant argues that the new amendments have overcome the rejections. Pearce discloses an embodiment (Figure 2) which discloses the frame structure as claimed. One in the art would appreciate that this structure provides a fixed support for controlling and supporting the operations.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George R. Koch III whose telephone number is (571) 272-1230 (TDD only). If the applicant cannot make a direct TDD-to-TDD call, the applicant can communicate by calling the Federal Relay Service at 1-800-877-8339 and giving the operator the above TDD number. The examiner can normally be reached on M-Th 10-7.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Fiorilla can be reached on (571) 272-1187. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

George R. Koch III
Patent Examiner
Art Unit 1734

GRK
8/8/2005